

WHAT IS CLAIMED IS:

1. A process for preparing an ethylene oxide (EO)-capped polyol comprising:
  - 5 a) charging a reactor with starter containing acid sufficient to acidify residual basicity in the reactor from a previous batch of ethylene oxide (EO)-capped polyol, with the proviso that no precipitate is formed by reaction of the acid with the residual basicity;
  - 10 b) adding and activating a double metal cyanide (DMC) catalyst;
  - c) feeding one or more oxyalkylenes to the reactor to produce a DMC-catalyzed polyol;
  - 15 d) adding a basic catalyst to the double metal cyanide (DMC)-catalyzed polyol to form a mixture comprising less than about 3 wt.%, based on the total weight of the mixture, of the basic catalyst,  
or  
adding to the double metal cyanide (DMC)-catalyzed polyol,  
20 an unrefined polyol prepared in the presence of a basic catalyst to form a mixture comprising less than about 25 wt.%, based on the total weight of the mixture, of base-catalyzed polyol and less than about 3 wt.%, based on the total weight of the mixture, of the basic catalyst; and
  - 25 e) ethoxylating the mixture at a temperature of from about 85°C to about 220°C to produce an EO-capped polyol.
2. The process according to Claim 1, wherein the double-metal cyanide (DMC) catalyst is zinc hexacyanocobaltate.
- 30 3. The process according to Claim 1, wherein the basic catalyst is chosen from potassium hydroxide and sodium hydroxide.

4. The process according to Claim 1, wherein the mixture comprises from about 0.05 to less than about 3 wt.%, based on the total weight of the mixture, of the basic catalyst.
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5. The process according to Claim 1, wherein the mixture comprises from about 0.1 to about 1 wt.%, based on the total weight of the mixture, of the basic catalyst.
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6. The process according to Claim 1, wherein the starter is chosen from polyoxypropylene polyols, polyoxyethylene polyols, polytetramethylene ether glycols, glycerol, propoxylated glycerols, propylene glycol, tripropylene glycol, alkoxylated allylic alcohols, bisphenol A, pentaerythritol, sorbitol, sucrose, degraded starch, water and mixtures thereof.
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7. The process according to Claim 1, wherein the one or more oxyalkylenes are chosen from propylene oxide, ethylene oxide, butylene oxide, isobutylene oxide, 1-butene oxide and 2-butene oxide.
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8. The process according to Claim 1, wherein the double-metal cyanide (DMC)-catalyzed polyol is a polyoxypropylene polyol.
9. The process according to Claim 1, wherein the double-metal cyanide (DMC)-catalyzed polyol includes a random or block copolymer of
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- oxyethylene and oxypropylene.
10. The process according to Claim 1, wherein the ethylene oxide (EO)-capped polyol is an ethylene oxide (EO)-capped polyether polyol.
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11. The process according to Claim 1, wherein the acid is chosen from inorganic acids, organic acids and derivatives thereof, carboxylic acids and derivatives thereof, dicarboxylic acids, halogenated organic acids and

derivatives thereof, amino acids and derivatives thereof, boronic acids and derivatives thereof, phosphonic acids and derivatives thereof, phosphinic acids and arsenic acids.

- 5      12.      The process according to Claim 1, wherein the acid is chosen from sulfuric acid, phosphoric acid, nitric acid, periodic acid, sulfonic acids and their derivatives, formic acid, acetic acid, propionic acid, benzoic acid, hydroxyl carbonic acid, lactic acid, mercaptosuccinic acid, thiolactic acid, mandelic acid, malic acid, tartaric acid, oxalic acid, malonic acid, succinic  
10      acid, fumaric acid, phthalic acid, 5-cholorsalicylic acid, trifluorolactic acid, 3,5-dibromosalicylic acid, 3-fluoro-4-hydroxybenzoic acid, boric acid, methylboronic acid, butylboronic acid, 2-thiophenediboronic acid, propylphosphonic acid, 3-aminopropylphosphonic acid, phenylphosphonic acid, phenylphosphinic acid and o-arsanilic acid.
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13.      The process according to Claim 1, wherein the acid is chosen from alkylbenzene sulfonic acids, alkyltoluene sulfonic acids and alkyl-naphthalene sulfonic acids.
- 20      14.      The process according to Claim 1, wherein the acid is chosen from dodecylbenzene sulfonic acid (DDBSA), dodecyltoluene sulfonic acid and butyl- or amyl-naphthalene sulfonic acid.
- 25      15.      The process according to Claim 1, wherein the acid is dodecylbenzene sulfonic acid (DDBSA).
16.      The process according to Claim 1, wherein the acid is lactic acid.
17.      The process according to Claim 1, wherein the step of ethoxylating  
30      is carried out at a temperature of from about 85°C to about 180°C.

18. The process according to Claim 1, wherein the step of ethoxylating is carried out at a temperature of from about 110°C to about 140°C.

19. The process according to Claim 1 further including a step of refining  
5 the ethylene oxide (EO)-capped polyol.

20. The process according to Claim 19, wherein the step of refining includes an ion exchange resin.

10 21. The polyol made by the process according to Claim 1.

22. In a method of making one of a polyurethane foam, coating, adhesive, sealant and elastomer, the improvement comprising including a polyol made by the process according to Claim 1.

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23. A process for preparing an ethylene oxide (EO)-capped polyol comprising:

- a) charging a reactor with starter;
- b) acidifying residual basicity in the reactor from a previous  
20 batch of ethylene oxide (EO)-capped polyol by adding an acid, with the proviso that no precipitate is formed by reaction of the acid with the residual basicity;
- c) adding and activating a double metal cyanide (DMC) catalyst;
- 25 d) feeding one or more oxyalkylenes to the reactor to produce a DMC-catalyzed polyol;
- e) adding a basic catalyst to the double metal cyanide (DMC)-catalyzed polyol to form a mixture comprising less  
30 than about 3 wt. %, based on the total weight of the mixture, of the basic catalyst,  
or

- adding to the double metal cyanide (DMC)-catalyzed polyol, an unrefined polyol prepared in the presence of a basic catalyst to form a mixture comprising less than about 25 wt.%, based on the total weight of the mixture, of base-catalyzed polyol and less than about 3 wt.%, based on the total weight of the mixture, of the basic catalyst; and
- 5 f) ethoxylating the mixture at a temperature of from about 85°C to about 220°C to produce an EO-capped polyol.
- 10 24. The process according to Claim 23, wherein the double-metal cyanide (DMC) catalyst is zinc hexacyanocobaltate.
25. The process according to Claim 23, wherein the basic catalyst is chosen from potassium hydroxide and sodium hydroxide.
- 15 26. The process according to Claim 23, wherein the mixture comprises from about 1 to less than about 35 wt.%, based on the total weight of the mixture, of basic catalyst.
- 20 27. The process according to Claim 23, wherein the mixture comprises from about 3 to about 30 wt.%, based on the total weight of the mixture, of basic catalyst.
28. The process according to Claim 23, wherein the mixture comprises from about 5 to less than about 20 wt.%, based on the total weight of the mixture, of base-catalyzed polyol.
- 25 29. The process according to Claim 23, wherein the basic catalyst comprises from about 0.5 to less than about 3 wt.%, based on the total weight of the mixture, of base-catalyzed polyol.
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30. The process according to Claim 23, wherein the starter is chosen from polyoxypropylene polyols, polyoxyethylene polyols, polytetramethylene ether glycols, glycerol, propoxylated glycerols, propylene glycol, tripropylene glycol, alkoxyated allylic alcohols, bisphenol A, pentaerythritol, sorbitol, sucrose, degraded starch, water and mixtures thereof.
31. The process according to Claim 23, wherein the one or more oxyalkylenes are chosen from propylene oxide, ethylene oxide, butylene oxide, isobutylene oxide, 1-butene oxide and 2-butene oxide.
32. The process according to Claim 23, wherein the double-metal cyanide (DMC)-catalyzed polyol is a polyoxypropylene polyol.
33. The process according to Claim 23, wherein the double-metal cyanide (DMC)-catalyzed polyol includes a random or block copolymer of oxyethylene and oxypropylene.
34. The process according to Claim 23, wherein the ethylene oxide (EO)-capped polyol is an ethylene oxide (EO)-capped polyether polyol.
35. The process according to Claim 23, wherein the acid is chosen from inorganic acids, organic acids and derivatives thereof, carboxylic acids and derivatives thereof, dicarboxylic acids, halogenated organic acids and derivatives thereof, amino acids and derivatives thereof, boronic acids and derivatives thereof, phosphonic acids and derivatives thereof, phosphinic acids and arsenic acids.
36. The process according to Claim 23, wherein the acid is chosen from sulfuric acid, phosphoric acid, nitric acid, periodic acid, sulfonic acids and their derivatives, formic acid, acetic acid, propionic acid, benzoic acid, hydroxyl carbonic acid, lactic acid, mercaptosuccinic acid, thiolactic acid,

mandelic acid, malic acid, tartaric acid, oxalic acid, malonic acid, succinic acid, fumaric acid, phthalic acid, 5-cholorsalicylic acid, trifluorolactic acid, 3,5-dibromosalicylic acid, 3-fluoro-4-hydroxybenzoic acid, boric acid, methylboronic acid, butylboronic acid, 2-thiophenediboronic acid,  
5 propylphosphonic acid, 3-aminopropylphosphonic acid, phenylphosphonic acid, phenylphosphinic acid and o-arsanilic acid.

37. The process according to Claim 23, wherein the acid is chosen from alkylbenzene sulfonic acids, alkyltoluene sulfonic acids and  
10 alkylnaphthalene sulfonic acids.

38. The process according to Claim 23, wherein the acid is chosen from dodecylbenzene sulfonic acid (DDBSA), dodecyltoluene sulfonic acid and butyl- or amyl-naphthalene sulfonic acid.  
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39. The process according to Claim 23, wherein the acid is dodecylbenzene sulfonic acid (DDBSA).

40. The process according to Claim 23, wherein the acid is lactic acid.  
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41. The process according to Claim 23, wherein the step of ethoxylating is carried out at a temperature of from about 85°C to about 180°C.

42. The process according to Claim 23, wherein the step of ethoxylating is carried out at a temperature of from about 110°C to about 140°C.  
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43. The process according to Claim 23 further including a step of refining the ethylene oxide (EO)-capped polyol.

30 44. The process according to Claim 43, wherein the step of refining includes an ion exchange resin.

45. The polyol made by the process according to Claim 23.
46. In a method of making one of a polyurethane foam, coating,  
adhesive, sealant and elastomer, the improvement comprising including a  
5 polyol made by the process according to Claim 23.